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ABSTRACT

There are various learning styles, each with its own characteristics. Some researchers have associated the different styles with specific brain hemispheres. In the past teachers generally have taught with one type of learning style in mind, with much emphasis placed on the outcomes of learning. Increased attention should be paid to the individual style of the learner, and to the processes of learning in general, instead of looking mainly to outcomes. A number of models and conceptual frameworks for teaching the social studies that emphasize learning styles and a whole brain approach can be identified. A 32-item list of references concludes the document. (DB)

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# Cognitive Style and Hemispheric Dominance: Piecing the Puzzle Together Toward Practical Application in Teaching The Social Studies

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*Typically, the information offered to teachers about motivational strategies focuses on controlling performance rather than on stimulating motivation to learn, and emphasizes the use of incentives, rewards, and grades rather than strategies designed to stimulate students to generate learning goals and the cognitive and metacognitive strategies to accomplish them. Jere Brophy (1986)*

## Introduction

Learning is a multifaceted and complex set of interactions that accomplish the processing of stimuli. Just as we internalize stimuli naturally and learn as human beings, we learn most preferably through our personal learning style: our innate inclination toward processing information. This article is a literature review of early research conducted in the area of cognitive style and recent studies, implications, and diagnostic instruments, used in determining style for the purpose of establishing educational excellence and student achievement. I have correlated the literature reviewed with the practical application in the curriculum domain of the elementary school social studies.

**Defining Learning Styles**

David Kolb has conducted prominent research in the learning styles domain. Kolb (1976) cites two main functions in the acquisition of information. 1. The perception of information is on a continuum from concrete to abstract. People who process information more concretely sense and feel their experiences. Those individuals who think about an experience through reflection tend to be more abstract. 2. Processing begins immediately once the information is received. Some individuals process through performing or doing and others process by means of reflection and observation. Kolb's research indicates that by pairing the two functions described above four distinct learning styles egress; Type I: sensor/feeler; Type II: reflective/thinker; Type III: thinker/doer; Type IV: Doing/Sensor/Feeler.

It is Kolb's hypothesis that educators primarily teach to Type II learners who make up 28-30 percent of the population. Seventy percent of the population is not addressed at all by teachers considering Kolb's assertion. That is an astounding figure.

In reviewing Kolb's further research and development of his *Learning Style Inventory,* students are identified in four specific styles: the diverger, the converger, the assimilator, and the accommodator. Kolb's

representation of strengths for each style type is as follows: *the accommodator* gets things accomplished, is a risk-taker, and possesses strong leadership ability; *the diverger* has creative visualization ability and a vivid imagination, understands people, identifies problems, and is adept at brainstorming; *the converger* has the skill to explicate problems, uses deductive reasoning, is a decision maker, and a problem solver; *the assimilator* develops theories and hypotheses, defines problems, invents models, and is well planned.

Keefe (1979) has defined learning styles as characteristics of cognitive, affective, and physiological behaviors that are relatively stable indicators of how learners perceive, interact with, and respond to a specific learning environment. Considerable research has been conducted by Keefe in the learning styles construct. Keefe's premise is that the archetype was eclectically defined from the precedence of research combined from these three distinct arenas: the personality theory; the information processing element of cognitive style research; and the research performed on an aptitude-treatment interaction premise. A multitude of inherent variables and environmental influences are determinents in an individual's style development.

From this theoretical basis, Keefe and Monk (1986) designed and

developed the *Learning Style Profile.* This inventory assesses cognitive processing factors (spatial, analytic, sequential processing, memory, simultaneous processing, discrimination, verbal-spatial); study preferences (mobility, posture, persistence, sound, time, lighting); perceptual responses (visual, emotive, auditory); and instructional alternatives (early morning time, late morning time, verbal risk, manipulative content, groupings, and temperature). This instrument is directed at grades 5-6 readability and is demonstrated to be a valid means of diagnosing the described criteria for learning styles and strategies.

Shipman and Shipman (1979) have included an abbreviated version of Messick's (1976, pp. 14-22) determined and defined multitude of relevant cognitive style descriptors in their article on the subject. Shipman and Shipman (1979) subscribe to the thought that clear boundaries in cognitive style have not been delineated in this area of research and that cognitive style is based primarily in the research of psychology pertaining to personality, cognition, and perception. I resonate with this perception. Various terminology and jargon are used interchangeably, specifically in the context of various studies, and may or may not refer to the broadly accepted definition.

## Early Paradigms in Cognitive Style Theory

Early research was done on the theory of cognitive style by testing the subject's perception and ability to differentiate an item surrounded by a field. (Witkin, 1950,1952) This style theory was termed as field dependent/independent. This assertion is now simply completed by a diagnostic embedded figures test. According to further study in this domain (Witkin & Berry, 1975), it was found that individuals that value conformity were more field dependent, and those who preferred individual variability were labelled as more field independent. Field independent persons easily identify simple figures embedded in a complex background. Locating the simple figures for the field dependent people is virtually unachieveable.

Later studies (Witkin, 1979) seemed to indicate that field independent individuals demonstrated more cognitive restructuring abilities and were relatively low on interpersonal competencies. Conversely, field dependent persons exhibited higher skill in interpersonal capabilities and lower ability in cognitive restructuring skills. Findings from extensive research conducted by Witkin, Moore, Goodenough, and Cox (1977) indicates that students identified as field independent and as field dependent do not differ in learning ability or memory ability but do

demonstrate considerable differentiations in acquisition of the individual's most easily learned material and the application of strategies they prefer to utilize in acquiring information.

Witkin et al. (1977) cited field independent individuals learn more efficiently in situations where intrinsic motivation is required. Other conclusions from Witkin et al. (1977) reported that field dependent children are more highly responsive to social reinforcement, and often have a stronger academic performance in classrooms where they receive positive teacher attention, feedback, and reinforcement and logically, they also respond more profoundly to negative teacher behavior directed toward them.

In the social domain, Witkin et al. (1977) found that persons demonstrating field dependent characteristics are more likely to function out of and engage in interactions from a social frame of reference. Their counterparts, the field independent preferents, attend more to facial features, and the verbiage used in a social context. Additionally, their opinions are more easily dominated by authority figures, especially in situations of ambiguity.

**TABLE 1. Dunn and Dunn's (1978) Factors In Learning Styles**

| | |
|---|---|
| **Environment** | **Emotionality** |
| **sound** | **motivation** |
| **light** | **persistence** |
| **temperature** | **responsibility** |
| **physical design** | **need for structure or flexibility** |
| **Physical Needs** | **Sociological Preferences** |
| **perceptual strengths (sight, touch, sound)** | **works best alone** |
| **intake (food, drink)** | **works best in paired situation** |
| **time of day (morning, afternoon)** | **works best with peers** |
| **mobility (needs to move around,can sit still)** | **works best with adults** |

## Current Research in Conceptual Styles

Dunn and Dunn (1978) have conducted extensive research in the field of learning styles. They have isolated 18 factors that define a preferred mode of student learning and that have a profound effect on the learner's function of processing and assimiliating presented instructional material for learning. (Note Table 1 for a complete breakdown of these elements.)

It is the recommendation of Kenneth and Rita Dunn that students be style-identified through testing, using their instrument design, the *Learning Style Inventory*. According to Rita Dunn, the *LSI* instrument is the most reliable, valid, and accurate diagnostic-style instrument for school-aged children available (1990). No further suggestion is made by Dunn for multi-instrument diagnosis to provide for comprehensive style evaluation.

The results of this assessment can be interpreted to create an appropriate learning environment, style-specific materials, and eclectic situations for the varying styles of students taught. Dunn documents that when students are taught in modes that are consistent with their style preferences, identified through the *LSI*, student achievement and attitide toward learning is statistically higher than instruction with an applied approach that is mismatched to student learning preferences (Dunn, Dunn, and Price 1975, 1979, 1981, 1985, 1989). With the results of the *LSI* , students demonstrate more tolerance of their peers in terms of learning styles, and become more personally responsible for their own learning (Dunn, 1990).

Renzuilli and Smith (1978) ascertain preferred instructional modalities by administering their rendition of a learning styles assessment, the *Learning Style Inventory*. Instructional student

preferences for interaction with curricular materials are measured in this inventory. The nine modes of preferred instructional student strategy assessed in this inventory include the following: projects, drill and recitation, peer teaching, discussion, teaching games, independent study, programmed instruction, lecture, and simulation learning. Results are then applied to individualized learning according to style preference.

Cohen (1969) delineated two styles of learning: analytical vs. relational (global) style.

Characteristics of the analytical style defined by Cohen (1969) are: stimulus-centered, parts-specific, extracts from embedded context, relationships are linear, objective attitude, long attention span, and reflective.

Cohen (1969) cited characteristics of the relational style as follows: person-centered, global, identifies the unique, relationships are holistic, subjective attitude, distractible, emotional, and impulsive.

Cohen suggests that children develop their cognitive styles basically through family interaction. Children who interact with families who are structured and have formal patterns of group organization tend to develop analytical styles of learning. Conversely, children who participate in fluid families and share in the function of the family group tend to

develop more relational styles. Through Cohen's research, it is indicated that there is a strong correlation between student achievement and the analytical-conceptual style. Teaching implications for Cohen's work are vast indeed. Are educators ignoring the implied under-achievement by the style and characteriestics of the relational-type students?

External bits of information that become internalized through learning are processed through three basic modalities: auditory, tactile (haptic and kinesthetic), and visual. *The Learning Channel Preference Checklist (LCPC)* is a reliable indicator of learning style preferences for students in grades 5-l3, according to O'Brien (1990). The inventory is an accurate determinant of how a student approaches a learning task and the strategies that are utilized in remembering and accommodating the presented information. A visual learning preference is characterized by learning most efficiently through the sense of sight. These student are confirmed note-takers, and rely heavily on graphs, pictures, and charts. Textbooks are the preferred means of learning over the lecture method. Statistics relate that 40% of students learn in the visual modality. Auditory learners would choose a lecture format over the textbook approach. It is the least developed of the learning modalities and cites less than l5% of the student population preferring this means of acquiring

information. The term haptic is derived from the Greek meaning, "moving and doing." This style preference of learning constitutes about 45% of students in grades 5-l3. These students are characterized by right brain dominance. Involvement, movement, autonomy, experimenting and sensory experience are all indications of a haptic learning modality.

Sunal (1990) documents that an awareness of learning styles in educating young children is of upmost importance in order to establish effective instructional strategies that will assist children in learning tasks. When there is a conflict between the conceptual skills that a child brings from the home culture and those required in the school setting, there is the possibility of a negative value judgment on the part of the teacher involved. Teacher acceptance of the particular learning styles of young children, has an effect on the child's feelings of self-efficacy and esteem which are especially formative at this time in their young lives.

**Brain Hemispherity and Learning**

Recent research has focused on the individual learner's preference for conceptual style in regards to processing through the specific brain hemispheres. The dominant attributes that the learner employs most systematically in approaching learning are rooted in scientifically-based

truths of the physical location of particular strategy functions in the brain. Right-brained preferenced learning is characterized by the following functions: visual/spatial, perceptual/sensual/lateral thinking, intuitive, spontaneous/creative, global/viewing the whole, tacit, receptive, symbolic/metaphorical, divergent, dream/fantasy/mystical. Left-brained receptors of information and specific functions include: verbal/numerical, logical/vertical, rational, linear time, focus, sequential/orderly, analytical in arrangement of elements, explict, active, literal, convergent, fact/reality.

Many significant research studies have been conducted by noted psychologists in the diverse, yet function-complimentary, modalities of the left and right hemisheric processes of the brain (Brooks and Obrzut, 1981; Ornstein, 1970, 1977, l978; Sperry, Gazzaniga, and Bogen, 1969). The brain functions simultaneously and many of the above right/left brain-hemispheric characteristics are interwoven into an intricate and uniquely integrated pattern.

Ornstein (1970) reasoned that the human population in Western societies exercise their left brain hemisphere sufficiently but neglect the right brain hemisphere. Interestingly, Eastern society naturally develops the right hemisphere of the brain with their culture of intuitive and

mystical thought. This hypothesis has provocative ramifications for comparing cultural richness and cerebral hemispheric style attributes. Because of the specialized functions of the cerebral hemispheres, Ornstein (1970) concludes, the physiological make-up of the grey matter in the brain is designed for two dichotomous types of thought. The following are just a few corresponding dichotomies in the implicit processes of the left-right hemispheres: intellect vs. intuition; convergent vs. divergent; intellectual vs. sensuous; vertical vs horizontal; abstract vs. concrete; realistic vs. impulsive; analytic vs. holistic; objective vs. subjective. The educational implications from this theoretical base are: educators have a responsibility to encourage whole- brain learning and processes for all individual preferences, as well as stimulate underdeveloped cerebral style functions, and to provide experiences that integrate brain hemispheric operations.

A Siamese twins analogy has been drawn by Edwards (1978). One of these Siamese twins (the left hemisphere) is a proficient talker, decision maker, is easily bored, enjoys solving problems, is a rational thinker, and dislikes ambiguity. The other twin (the right hemisphere) is an active perceiver of the global picture, is an intuitor, and is holistically insightful and creative. The two must go everywhere together and

experience a mutual existence. This analogy is an accurate example of how the two brain functions are operant together. Other variables included in the smooth transmission are: the individual's overall physical and emotional health, and the ever expanding social and cultural knowledge base. In a healthy learner, the two brain hemispheres are in constant interaction through processing, decoding, and encoding information regardless of the domain specific experience.

Myelination is the term synonymous with the process of nerve fiber maturation. Nerve fiber development seems to be directly correlated with Piaget's stages of cognitive development (Sinatra, 1983). Myelination affects the physiological ability in language acquisition and language tasks. Tasks in language require brain hemispheric integration. Visual/spatial experiences and activities that allow for tactile manipulation stimulate myelin development which promotes the simultaneous interaction of the two brain hemispheres. As fiber systems mature between the two brain hemispheres, verbal and non-verbal learning is coordinated. Some researchers have determined that children deprived of adequate stimulation of the senses that provide for myelin development are unable to properly receive information, process information, and express meaning (Eisner, 1981). This significant research mandates a

multiplicity of experiences be provided for learners, especially young learners, to stimulate sensory perceptors and enhance myelination.

**Implications For The Instruction of The Social Studies**

How can this cognitive style information impact the instruction of the content domain of the Social Studies? Geneva Gay (1982) gives credence to the voice of many an educator in her hypothetical notions listed at the beginning of her article, "Developmental Prerequisites for Multicultural Education in the Social Studies": "Start with where the child is." "Instructional content, materials, and experiences must be compatible with the maturational levels of the students." "To achieve maximal results, learning activities should build upon the attitudes, values, and skills that each individual brings to the classroom." There is a world of truth to these generalizations.

The first concern of Social Studies educators should be in the curriculum and instruction of the content and how it is tailored appropriately for the learner's developmental capabilities. Inherent styles, prior experiences, skill level, and strategies for learning must also be considered. How can a child learn about the concept of community if she/he has only lived life in a family that is isolated from the

community? If Social Science instructors implement a democratic and pluralistic societal classroom environment, students will learn by the model. As a result of the teacher's understanding of developmental learning theories, he/she is better equipped to offer ethnic and cultural pluralism in a logical framework for presenting the Social Studies content. Many models are available to address the variety of strategies necessary to encompass a holistic approach to learning. Ultimately, the model a teacher implements through instruction will be grounded in the teacher's own foundation in learning theory, the integration of the teacher's own cognitive style into the theory, and the set of personal, educational beliefs subscribed to by the teacher regarding the myriad schemas of student learning. It is extremely unfortunate that educational research affects so few elementary classroom environments. There have been many innovative constructs and diagnostic instruments developed to encapsulate the theories presented on cognitive style. Some of these paradigms will be examined in relationship to sound educational practice in teaching the social studies curriculum through a student-centered approach.

**Models and Conceptual Frameworks Incorporated in Teaching The Social Studies Through Learning Styles and Whole-Brain Approach**

Long range planning, in the form of teaching resource units presented every 4-6 weeks on a given topic, is a competent means of holistic instruction in the Social Studies. The unit is an organized, logically sequenced group of plans, encompassing the textbook as a resource, and other related materials gathered on the topic to present a multisensory, experiential, approach to a specific topic appropriate for the developmental level and the scope and sequence of the particular grade level involved.

This is purposeful instruction that is composed of facts, concepts, generalizations, skills, values content, and creates opportunities for information processing in a construct to stimulate student inquiry into the chosen topic.

All lessons that compose the unit, orchestrate the experiences, activities, research, field trips, and expert speakers on the topic, etc., and are related to and support concept/skill attainment of the objectives defined. Unit objectives are precursory to identifying specific daily lesson objectives. Evaluative techniques are also multisensory in nature

and check the student mastery of each lesson objective.

Resources for these teaching units can include the following: realia and artifacts (real articles used in various cultures, tapestries, music, pictures, etc.); food experiences (having students cook and taste authentic dishes from ethnic groups, cultures, countries, and/or specific regions of a country); children's literature on the specific topic (fiction and nonfiction); hyper-media programs/games to stimulate concept development or reinforce learning (micro-computers and computer software); art projects of all varieties (painting, clay, construction paper models, quilt making, weaving etc.); records, audio-tapes, video-tapes, films, slides, and filmstrips that correlate, spark inquiry, and define concepts on the subject-matter; gathered and appropriate reference books, maps, globes, and atlases; other printed materials such as: graphs, charts, newspapers, *My Weekly Reader*, and other children's periodicals, etc.; student simulations of actual historical occurrences and hypothetical simulations created from student imaginations (plays and musicals included); the students' research on their personal family history, the multitude of possibilities in group or individual projects on the topic of study; student participation in gathering data on the particular topic, developing hypotheses, confirming and/or rejecting hypotheses, and

applying the results; role playing activities; teacher-made, student-made, or commercially-made learning games that correlate with the topic; and participation in student-led and/or teacher-directed discussions.

In the resource teaching unit approach to instruction in the Social Studies, the activities that relate to a left-brained dominant student, (analytical, field independent learner) are some of the following: making scrapbooks, making displays, record keeping, collecting facts, following directions, demonstrations, drill and repetition, individual projects, and working in workbooks and on worksheets.

Activities that appeal to right- brain dominant students (generally labelled as field dependent, global, intuitors) are as follows: creative writing experiences, guided imagery, artistic endeavors, mythology, self-expressive activities, and cooperative learning.

Activities that would be integratively diverse are: acting, interpreting gathered data, hypothesizing, simulation games, creative dramatics, oral reports, brainstorming, independent research, role playing, group sharing, writing essays, journal entries and logs, and designing experiments. (Jones and Jones, 1990).

## THE 4MAT SYSTEM

Bernice McCarthy (1990) has a theoretically based approach to whole- brained instruction modeled from research findings in the arenas of learning styles and brain functioning. This is the 4MAT System and is comprised of an eight-step cycle of instruction that is grounded on research in education, management, neurology, and psychology. Many noted theorists have contributed to the design format (Kolb, 1981, 1984, 1985, Jung, 1923, Piaget, 1970 and others). This system is designed to provide the optimum medium to accommodate all types of learners while inherently encourages stretching of less preferred styles. McCarthy (1990) delineates the learning style dimensions as the following four major types.

Type One: imaginative learners who perceive information concretely and work harmoniously, commitedly, and in a personal frame of reference.

Type Two: the analytical learners who perceive data in abstract form and process information by reflection.

Type Three: the common sense learners who conceptualize information abstractly and process it by activity. Interaction between theory and practice is also characteristic of this style.

Type Four: the dynamic learner is one who learns by trial and error,

easily integrates experience and application, demonstrates enthusiasm about new learning situations, and has a flexible and experimental approach to learning.

The 4MAT method of instruction is composed of four quadrants that correspond with the major learning style preferences: personal meaning, content and curriculum, usefulness, and creativity.

In quadrant one, the teacher provides "hooks" for students to relate the objective of the chosen topic to their personal life. The motivation is to attract student interest and to inquire about the subject of proposed learning. There is the "why" involvement here. The question, "Why is this information important to me?", becomes relevant to the learner.

Quadrant two exposes the student to the "what" of the content and curriculum. This portion of the framework factors in the conceptual development of the theme and the skills necessary in concept acquisition, integrated with the previous reflective analysis of quadrant one learning.

Guided practice, and a more student centered approach is characteristic of quadrant three. The student becomes the user of the concepts and skills. The overriding question is, "How does this work?"

Higher level thinking, formal operations, and metacognitive skills are the productive elements of quadrant four. This is the application

stage. The key question here is, "if?" Creativity, self evaluation, and self discovery prevail in this quadrant.

Quadrants one and two are primarily direct instruction led by the teacher as the model and articulator of meaning; the leader. Facilitative learning is characterized in the more student directed mode in quadrant three and four. The teacher becomes the encouraging coach and the facilitator of innovation. Students practice and personalize in the last two quadrants before they engage in creating and integrating the learned information into their lives.

Practical application for the elementary Social Studies curriculum using the 4MAT model is described as follows.

*Quadrant One:* Left Brain; introduction of the topic, identification of concepts, the reason this information is relevant to the student's lives, examples of the topic are shown and discussed, students participate interacting in discussion. Right Brain; students manipulate relevant objects (artifacts, food, clothing, etc.) to the topic, they interact in learning centers constructed on the subject of instruction, students are involved in locating related objects and concepts to the topic of inquiry.

*Quadrant Two:* Left Brain; teacher directs reading of the textbook and related information, (observing, classifying and analyzing pictures,

music, filmstrips, movies, slides, field trips) regarding the topic. Right Brain; students make their own replica of the presented information, (observing, classifying and analyzing art projects, simulations, illustration, etc.), students give oral presentation on projects from research and used reference materials.

*Quadrant Three:* Left Brain; students read printed material under teacher direction, they identify key concepts from pertinent information, the teacher provided activities are practical application, (computer games, experiments, etc.). Right Brain; students can describe why information is necessary (tests and quizes, brainstorm life without the topic of study, expand on information through research, hypotheses in writing, and plan a study on the topic.

*Quadrant Four:* Left Brain; students work cooperatively to design replicas, maps, presentations, and projects; students provide practical rationale for the above projects, and cite potential conflicts in rationale or hypotheses and may need to revise hypotheses. Right Brain; teacher and student evaluate projects and activities together, students experiment with hypothetical applications, and transfer the learned information into another new area.

Using the 4MAT System teachers meet all student needs at some

point on the quadrants. Specific activities are provided for both left and right cerebral hemispheric preferences, and concurrently offer experiences to develop less preferred functions. This system also meets the teacher's dominant style of teaching. Chances of teacher/student engagement in style conflicts using this system of instruction are minimal. The 4MAT System is, of course, transferrable to any content specific curriculum area.

**THE LEARNING CYCLE**

The Learning Cycle (Sunal & Haas, 1991) model is conceived from cognitive and information processing research and is specifically tailored for teaching concepts, skills, and generalizations; the content of the Social Studies. Sunal and Haas (1991) emphasize that the Learning Cycle framework should be a part of an overarching classroom climate that attends to student creativity, self-efficacy, responsibility, and respect for self and others.

There are three distinctive Learning Cycle models for the following types of social studies lessons: experiential, focusing on process skill development; concept attainment, which concentrates on forming and reconstructing concepts and the ability to define and describe concepts;

and the inquiry lesson, geared toward the formation and/or reconstruction of generalizations, forming hypotheses, accepting or rejecting hypotheses, and applying the information. The phases of the cycle in each of the three models are labeled as exploration, invention, and expansion.

The exploration phase deals with an idea, skill, concept or question. This is a student directed experience to provide a background for typically new information and data. Focus for learning happens here. This is also the phase in which prior student learning is "hooked" to the new concepts, generalizations, skills, or variables introduced through student exploration. This phase's characteristics include: minimal teacher direction, provision of an experience to generate student questions, often a hands-on activity for student manipulation/discovery, and gives students the objective and purpose of the lesson.

The next sequential phase is the invention. This is a more teacher directed format that builds on the acquired information from the exploration phase. The invention introduces students to new concepts, situations, and generalizations through an explanation of the key information. This phase is designed to stimulate application and accommodation of learned information. This introduction is formally presented in a variety of instructional modalities; films, slides, lecture,

learning centers, and textbooks/reference materials; for example. The information provided by the teacher in this phase is clarified through examples and nonexamples of the concept, by teacher modeling the skill, and by the teacher directing the pattern in developing hypotheses. This phase is concluded by a statement of closure on the concept, skill, or generalization.

The final phase in the cycle is expansion. It is the point of application, guided practice, final practice and/or transfer of the skill, concept, and generalization. Independent activities are often part of the procedure of this phase. The expansion provides for learning by repetition which leads to self-regulation/transfer. The information presented for learning is more easily stored in the long term memory because of the relevance in application. This is the phase where the concept, skill, and/or generalization is hopefully integrated into the learner's knowledge base.

Some social studies content methods of providing students with appropriate learning procedures in each of the three Learning Cycle phases would be as follows:

Exploration: anything that students can openly explore; preferably a hands-on type of activity that would include one or more of the following:

pictures, clothing, food, music, slides, realia, artifacts, and the like.

Invention: teacher directed instruction and activities; resources for student research, books, magazines, videos, films, hyper-media, student conducted interviews, data collection, examples of what the skill or concept is and is not, teacher lecture, learning centers on the skill or concept, speakers, field trips, experiments, scrapbooks, charts, and graphs, or any other means of providing additional information regarding the skill, concept, or generalization.

Expansion: provision is made for guided practice and application of information through reports, presentations, projects, creative writing, related computer software, personal historical research, creative dramatics, plays, artistic endeavors, integrated activities with other curriculum domains, solving a related problem, field trips, or the student's choice of an applicable creative independent project.

This Learning Cycle is a logically sequenced approach to provide meaningful learning experiences for all learning style preferences and cerebral hemispheric dominant learners. This approach provides a framework for planning and teaching in the social studies that encourages student achievement, the construction of knowledge into the learner's individual learning schema, and student development of cognitive and

metacognitive strategies while simultaneously providing experiences that motivate and ignite student interest in the learning process.

## IN CONCLUSION

Effective learning strategies employed by educators to facilitate all learners must be a priority as education faces its many pressing issues: the drop-out rate, teacher accountability, tax cuts, political influences, drugs in the schools, and the other multitiude too numerous to list. We, as educators, strive to increase student learning, inspire the masses, provide for the slow learner, present material that will appeal to all styles and brain dominant students, and motivate the apathetic. It is a tough set of problems to solve. Yet, often, research is significantly and repeatedly provided for sound educational practice that would facilitate solving some of these dilemmas. But the implementation of these research findings, tools, models, and strategies that would aid our future is at a rate that is slow to never in permeating elementary school curriculums.

Educators have a didactic responsibility to continue learning and provide the most effective models for instruction to included every type learner. There will always be unanswered questions. There will always

be room for refining and redefining. This review is one part of the truth. It answers many questions and refines and defines much of where education has been regarding learning styles and hemispheric brain functions. We will continually revisit cognitive styles, cerebral hemispheric functions, and how the research implications can be applied to the content of the social studies. The most promising aspects of this review is that in providing quality instruction for learners of all stylistic dimensions, educators broaden their perspective on the richness of culture, the diversity, and uniqueness, of each individual learner. Could we be influencing the future of society by implementing these holistic models into the social science curriculum? Will this not impact citizenship, in the classroom now, and our communities in the future? I believe so. This is the nature of the social studies.

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